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DOCUMENT-IDENTIFIER: US 6383928 B1

TITLE: Post copper CMP clean

Abstract Text (1):

A non-contact post CMP clean-up process. A corrosion inhibitor is used to protect the copper (118) surface to prevent an electrochemical reaction between the p-well and n-well areas. A multi-step wet chemistry is used to clean all exposed surfaces without etching more than 100 .ANG. of the dielectric (110), copper (118), or liner (116). The first step uses a basic solution and a surfactant (124). The second step uses a diluted HF solution (126) and the third step uses an organic acid solution (128).

Brief Summary Text (8):

The invention is a non-contact post CMP clean-up process. A corrosion inhibitor is used to protect the copper surface to prevent an electrochemical reaction between the p-well and n-well areas while polishing. A multi-step wet chemistry is used to clean all exposed surfaces without etching more than 100 .ANG. of the copper, liner, or dielectric. The wet clean chemistry is a batch process that allows high throughput and is cost effective.

Detailed Description Text (10):

The first step uses a basic solution and a surfactant, 124, as shown in FIG. 2E. If desired, an optional rinse with megasonic may be performed prior to introducing these chemicals. The basic solution may comprise NH.sub.4 OH or TMAH (tetramethylammonium hydroxide) at less than 0.1% wt. The surfactant may be on the order of 0.1% (e.g., 0.5 to 2%) surfactant. This step is used to remove slurry particles. The mixture of basic solution and surfactant may be used for a duration in the range of 3-5 minutes with megasonic. Both the surfactant and the corrosion inhibitor help protect the copper surface from NH.sub.3 attack. As discussed above, the corrosion inhibitor forms a compound 120 on the copper surface that prevents or slows the NH.sub.3 etching. A quick-dump-rise (QDR) is then performed.

CLAIMS:

6. The method of claim 1, wherein said basic solution comprises TMAH.
18. The method of claim 13, wherein said basic solution comprises TMAH.